



Proceedings of The Board of Forestry

held at Dehra Dun from the 22nd to the 27th October 1934.

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Proceedings of the Board of Forestry, held at Dehra Dun, from the 22nd to the 27th October 1934.

The Board of Forestry met at the Board room of the Forest Research Institute, Dehra Dun, from the 22nd to the 27th October 1934.

The following were present:—

- Mr. C. G. TREVOR, C.I.E., Inspector General of Forests.
- Mr. F. CANNING, C.I.E., Chief Conservator of Forests, United Provinces.
- Mr. J. WHITEHEAD, Chief Conservator of Forests, Central Provinces.
- Mr. C. E. L. GILBERT, Chief Conservator of Forests, Bombay Presidency.
- Mr. R. N. PARKER, Chief Conservator of Forests, Punjab.
- Mr. A. WIMBUSH, Chief Conservator of Forests, Madras Presidency.
- Mr. E. O. SHEBBEARE, Conservator of Forests, Bengal.
- Mr. A. J. W. MILROY, Conservator of Forests, Assam.
- Mr. H. L. WRIGHT, Conservator of Forests, N. W. Frontier Province.
- Mr. J. S. OWDEN, Conservator of Forests, Bihar and Orissa.
- Mr. A. R. VILLAR, Conservator of Forests, Burma.
- Mr. Z. D. AHMED, Superintendent, Office of the Inspector General of Forests, acted as Secretary of the Board.

Mr. Trevor welcomed the members of the Board on behalf of the Government of India and the Forest Research Institute. Only one officer of those attending the last meeting of the Board of Forestry held in 1925 is still in service and it is desirable that more frequent meetings of the Board should take place in order to maintain the necessary co-operation between the Heads of Departments in the various provinces in India. The proceedings of the last meeting of the Board of Forestry were reviewed and the action taken on each item explained. The attention of members was also drawn to various matters of forest policy which would shortly require earnest consideration by Heads of Departments and local administrations.

In conclusion it was pointed out that the Forest Research Institute existed entirely for the benefit of forestry and forest industries in the various provinces of India and that without the cordial co-operation of the Heads of Departments and all concerned the Institute could not function as it should. The Board then proceeded to consider the agenda item by item as follows :—

SUBJECT No. 1.

Is the Forest Research Institute doing all that is possible to advance forestry and the proper utilization of Forest Products? If not, how can its functions be improved?

The discussion was opened by the Inspector General of Forests who drew the attention of the Board to the detailed proposals of Branch officers in this respect. It is the opinion of the Forest Research Institute that their work is not sufficiently known to the forest staff in provinces and that the research programmes prepared by the Institute do not receive the detailed criticisms and amendments by provinces to which they should be subjected. The following suggestions were put for the consideration of the Board and after full discussion were adopted unanimously :—

(1) All Heads of Departments should keep a register of research items in which may be entered from time to time suggestions for items to be included in research programmes. This would assist in dealing with the draft triennial programme of research when received from the President, Forest Research Institute.

(2) Provinces should as a matter of course send their Silviculturists and Utilization Officers to Dehra Dun to gain a thorough knowledge of the work being done in the Forest Research Institute.

(3) That provinces should assist with the local staff in Entomological work as in the case with Silviculture.

(4) That the problem of Forest soils is an urgent matter which should be dealt with by the Forest Research Institute.

SUBJECT No. 2.

Is it not possible for closer touch to be maintained between the Forest Research Institute and the ordinary Divisional Forest Officers in provinces?

*Note :—*Very few executive officers ever visit the Institute.

This matter was discussed in all its aspects. Mr. Shebbeare stated that better value for money was obtained by the touring of research

officers in Provinces than by sending Divisional Forest Officers to Dehra Dun ; as research officers touring in provinces established contact with most of the executive staff. After visiting the sections of the Utilisation branch Mr. Wimbush emphasised the importance of the Forest Economist touring in the provinces and meeting forest officers and the heads of business firms. The resolution below was finally adopted :—

RESOLUTION.

1. That every encouragement should be given to forest officers to visit the Forest Research Institute and to work for a longer or shorter period in any of the branches. The Board consider that a three months course of study in the Branches of the Forest Research Institute would be of the greatest benefit to junior officers.

2. That officers of the Forest Research Institute especially all heads of branches should be afforded full facilities for touring in the provinces with a view to gaining first hand experience of the local conditions and disseminating their knowledge among the administrative and executive staff and firms interested in the distribution of forest products.

SUBJECT NO. 3 (a).

Functions of the Inspector General of Forests. His responsibilities regarding working plans, etc.

This matter was discussed on the lines of the Inspector General of Forests' note.* It was decided that in future the submission of working plans to the Inspector General of Forests for scrutiny should be on an entirely voluntary basis. Heads of departments may send any plan on which they require the advice of the Inspector General of Forests. *A typed copy of all plans should be sent to the President, Forest Research Institute, for information and return as a routine procedure*; such plans will not be criticised. Working Plan Officers and Conservators of Working Plan Circles may correspond un-officially with the Central Silviculturist on all silvicultural and statistical subjects connected with working plans. It was pointed out to the Board that the Bengal Government desired that all Bengal working plans should be subject to the criticism of the Inspector General of Forests. In this case orders to this effect should be entered in the provincial forest manual. This procedure is open to adoption by any province desiring to follow it and the Inspector General will only be too willing to give his time to advising on working plan matters when such advice is really desired.

Heads of Departments can consult the Inspector General on any working plan matter at any time, and the Inspector General can also address local Governments officially on the prescriptions of any plan.

* Not printed.

Deviation Statements.

As the Inspector General of Forests has no longer any responsibility for the control of working plans, Deviation Statements as prescribed by Art. 53 (ii) of the Forest Department Code should no longer be sent to him.

2. Copies of all amendments to working plans should be sent to the President, Forest Research Institute, as a matter of routine.

Working Plan Summaries.

The Board agreed to the proposals of the Inspector General regarding working plan summaries which should be prepared by the Working Plan Officer as early as possible and sent to other provinces, President, Forest Research Institute and Hon. Editor, *Indian Forester*; and confirmed resolution No. 4 of the Silvicultural Conference passed in 1929 that provinces should charge a nominal price of Rs. 2 per copy for up to two copies of any working plan supplied to other provinces requiring them. This charge to include any maps issued with the plan. Other maps for which a special request is made to be supplied at cost or on loan.

SUBJECT No. 3 (b).

Continuation of the Board of Forestry with definite orders and obligations for its periodic meetings.

When this matter came up for consideration all members of the Board expressed themselves strongly in favour of retaining the Board. It was urged that the Board provided a somewhat infrequent meeting ground for the Heads of the Forest Departments all over India where they could ventilate their professional difficulties, exchange ideas and discuss matters of interest to all. It was considered that with decentralisation the Board would prove of even greater use and importance in future and the amount spent on travelling allowance would be more than repaid.

The following resolution was unanimously adopted :—

RESOLUTION.

Resolved that the Board of Forestry is essential for the welfare of forestry in India and that this Board should normally meet triennially. The functions of the Board are :—

- (1) To discuss administrative and professional questions common to several provinces.
- (2) To consider matters of forest research.
- (3) To co-ordinate scientific forestry throughout India.

SUBJECT NO. 3 (c).

Forest education both Class I and Rangers.

In opening the discussion on this subject the Inspector General stated that as Burma had made separate arrangements regarding their training the discussion should be confined to India. From his experience as Vice-President and Professor of Forestry of the late I. F. S. College he was of the opinion that a perfectly good education in forestry could be provided for candidates for the superior forest services in India and that it was unnecessary to send students for this purpose to European countries. He suggested that after serving for 5 or 6 years young officers should be sent to the Imperial Forestry Institute, Oxford, to give them experience of European forestry. The Board was prepared to accept this statement.

The question of comparative cost of training in India and in England was then raised and it was considered that if a sufficient number of students was forthcoming it would be cheaper to impart training in India. The Inspector General also pointed out that the political aspirations of India would probably demand training in forestry being provided in this country.

He stated that unless there was a unanimous demand by Provincial Governments for training in India no forest college could possibly be revived, but it was generally agreed that if the Forest College at Dehra Dun was revived and that if the cost of training was comparable, Members of the Board would be prepared to recommend to their Governments to train all their Class I officers at Dehra Dun.

There are apparently 388 gazetted officers serving in the provinces of India and without allowing any margin for casualties it appears that the recruitment of 12 to 15 officers a year would be necessary once normal conditions have been re-established, and that this number would fully justify the re-establishment of the college at Dehra.

The Board was of the opinion that it was useless for Indian students to study forestry in Universities abroad with a view to obtaining employment in India and that this fact should be brought to the notice of the High Commissioner for India.

As regards the Rangers College at Dehra Dun, the Inspector General pointed out the responsibility of the provinces concerned for maintaining this institution. Both Dehra Dun and Coimbatore have been established by their respective Governments for the benefit of the provinces and for this reason alone every possible use should be made of the facilities provided.

The Board agreed with the Inspector General that all directly recruited rangers and such men already in service as require training for the post of ranger should be sent to Dehra Dun or Coimbatore.

Further in the case of ranger students at Dehra Dun and Coimbatore, the Board agreed with the present decision that private students should not be admitted unless they had obtained a guarantee of employment

• SUBJECT No. 4.

Questions relating to the Finance and Accounts of the Forest Department especially interest. The proper crediting of forest produce given away by Government or other allocations of forest revenue.

The Board considered the situation arising from the Bihar and Orissa letter to the Government of India on the subject of the exhibition of interest in the forest budget and were unanimously of the opinion that no interest should be charged in forest department accounts except in cases where loan money was actually employed on some definite work of a productive nature. Similarly the present differentiation between capital and revenue expenditure should be discontinued except in the above cases.

The inclusion of interest in the forest budget as presented to the Legislative Council leads to misunderstanding of the current financial results of the working of the forest department and should be omitted.

Further many items such as lease money and share of revenue paid to third parties are at present shown as expenditure, whereas such items are in reality an allocation by Government of revenue earned on working the forest. To show such items as expenditure frequently gives an entirely wrong impression of the financial results of forest operations. In certain cases the incidence of rights, free grants and concessions is so high that the revenue derived from the forest estate is insufficient in itself to meet the expenditure on maintenance and regeneration. The cost of such rights, free grants and concessions to individuals and communities, therefore falls on the general taxpayer of the province; and while all expenditure on this behalf is shown in the books of the forest department no corresponding value can be credited to revenue.

SUBJECT No. 5.

Proposal to establish a Central Clearing House for information and marketing of timber including the proposed employment of a Utilization Officer.

It was the unanimous opinion of the Board that the employment of a Utilization Officer attached to the Forest Research Institute would be of great benefit to many provinces. Such an officer would be in a position to co-ordinate marketing of timber between various provinces now competing in the same market.

He would fulfil in himself the functions of the proposed clearing house. In the absence of such an appointment the Board did not consider that a Central Clearing House would be of much advantage or would even be a practicable proposition.

SUBJECT NO. 6.

Revision of forest Settlements where they have become out of date and unworkable.

The Board considered several defects in the provisions of the Indian Forest Act, more especially the inability to close to grazing portions of reserved forest subject to rights when closure is required for purposes of regeneration, unless this had been provided for in the record of rights; and the impossibility of managing forests where the demands of the right-holders exceed the available outturn of the forest. They were of the opinion that these questions should be dealt with at any future revision of the Indian Forest Act or any provincial Forest Act to take its place.

SUBJECT NO 7.

Provincial organisation of the Forest Department, particularly the question whether two classes of Indian gazetted forest officers are required.

The question of the future organisation of the forest services in India was considered. The difficulties of varying grades of pay and classification of services were pointed out and it was considered a pity that similar scales of pay could not have been settled throughout all provinces.

Most provinces considered that only a Class I forest service was necessary, but Burma and Bombay contemplated a Class I and Class II service for reasons applicable to them. Bombay would, however, be content with one gazetted service with a junior and senior scale.

An argument against a single gazetted service was that it would practically close down the existing avenue of promotion to gazetted rank for the deserving ranger as promotions from subordinate rank to what will be the equivalent of the Indian Forest Service would be undesirable. It was however recognized that in exceptional cases promotion to Class I should not be entirely closed to really deserving men. The United Provinces in addition to providing for this have published their intention of constituting an Upper Subordinate (non-gazetted) Service for deserving rangers. On the other hand the discontent resulting from having a Class I and Class II service has been brought to the notice of the Board by memoranda submitted by several associations of the Provincial Forest Service officers, the main object of which appears to be a demand for amalgamation with the present Indian Forest Service. It is understood that certain Local Governments have already framed statutory rules dealing with the future organisation of the services and under these circumstances the Board as such is not in a position to express an opinion on the future of the existing members of the Provincial Forest Service.

SUBJECT No. 8.

The position of Conservators and Chief Conservators under the new constitution.

The Board unanimously supported the view of the Government of Bengal recorded in their letter No. 100-T./For., dated the 26th September 1934, to the Government of India, Department of Education, Health and Lands, that the all-India status of Conservators and Chief Conservators of Forests in provinces other than Madras, Bombay and Burma should be maintained as at present and for so long as the existing officers recruited on an all-India basis remain in service. The Board considered this necessary both in the interests of forestry in India as well as of the individual officer.

SUBJECT No. 9.

Question of control of imposition of import duties on forest produce under the new constitution by one province against import from a neighbouring province.

It was considered by the Board that this matter would no doubt be dealt with in connection with the new constitution along with other questions relating to interprovincial trade.

SUBJECT No. 10.

Question as to the wisdom of the policy of admission of rights and privileges of local inhabitants in forests and recognising and defining the difference between a right and a privilege.

The Board considered that in all new forest settlements no rights should be given which render the proper management of the forests impossible; nor should forest produce be given in quantity which is in excess of the present annual increment or outturn of the forest, and that in determining the extent and nature of the rights granted these should be limited to what the forest can support without the rights becoming a burden on provincial revenues.

SUBJECT No. 11.

Forest publicity.

This question has been discussed previously by the Board of Forestry (cf. subject No. 5 of the meeting held in 1925). The methods of propaganda in vogue at present were described and discussed. Much is

already being done by school pamphlets, broadcasting, publishing articles in the press and delivering lectures on the advantages of forest conservancy. The Chief Conservator of Forests, United Provinces, described the good and useful work done by the Kumaon Forest Advisory Committee and Mr. Owden that done by the Forest Association in Bihar and Orissa. The Punjab endeavour to educate the rural masses through notes published by the provincial Publicity Officer in the vernacular press. The necessity for increasing the knowledge of the general public of the work done by the Forest Department was emphasised and it was agreed that all possible steps should be taken to this end.

SUBJECT No. 12.

Trade names for Indian Timbers.

Captain H. Trotter, Forest Economist, was present during the discussion on this subject. The necessity for revising the list of trade names for Indian timbers as published in the Handbook of the Empire Forestry Association and as given in Bulletin No. 71 of the Forest Research Institute was emphasised by the Inspector General of Forests and Captain Trotter with a view to limit the list to timbers of real commercial importance. This was agreed to by the Board and after some discussion it was decided to prepare two lists—one for publication in the Handbook of the Empire Forestry Association which should include mostly timbers which are, or are likely to be, of commercial value in foreign markets only, i.e., timbers for export from India and the other to include timbers which are also of provincial and/or inter-provincial importance to trade in India. Accordingly the two lists published as Appendix I were prepared by the Board. List A for publication in the Empire Handbook and List B to be published as a Bulletin by the Forest Research Institute.

SUBJECT No. 13.

Discussion of methods of interchanging information regarding probable leave vacancies and casualties in provinces with a view to enable the Government of India to intimate provinces regarding provisional postings of Conservators and Chief Conservators earlier than at present.

In opening the discussion the Inspector General of Forests brought to the notice of the Board the present procedure in regard to the posting of Conservators and Chief Conservators in provinces other than Bombay, Burma and Madras and explained that under the recent orders of the

Government of India he was precluded from conducting direct correspondence on the subject with Heads of Forest Departments or individual forest officers. The Board recognised the difficulties which must arise from such an arrangement.

However, in order to facilitate as much as possible leave and posting arrangements the Board suggested that Heads of Forest Departments in provinces other than Madras, Bombay and Burma should intimate demi-officially twice a year to the Inspector General of Forests, on such dates as he may specify, particulars regarding Chief Conservators of Forests, Conservators of Forests and Deputy Conservators of Forests of 15 years service and over desiring to take leave during the following 12 months and recommends that the Inspector General of Forests should be authorised to communicate this information in a consolidated form to all Heads of Forest Departments for their information.

The Board also desired that the publication of the combined Classified list of Forest Officers should be expedited as much as possible.

SUBJECT No. 14.

Standardization of symbols and colours for forest maps.

The symbols and colours used for forest maps have already been standardised in accordance with resolution No. 16 of the Board of Forestry held in 1919. With a view, however, to effect certain improvements and to remove all misunderstanding and confusion about their use, the Survey of India have now suggested a new standard table which was explained to the Board by Colonel C. G. Lewis, O.B.E., R.E., Director, Geodetic Branch, Survey of India, who very kindly attended the meeting when this question was discussed.

The Board agreed to re-affirm the resolution passed in 1919 and decided that all Working Plan and Divisional Forest Officers should be asked to adopt and adhere to the new standard table of symbols and colours to be supplied by the Survey of India.

In addition to the items included in the agenda of the Board of Forestry opportunity was taken to discuss the following questions of interest to members of the Board—

- (1) The scope of the Annual Research Report issued by the Forest Research Institute, Dehra Dun.
- (2) The influence of the growing use of substitutes for timber upon forest policy.

- (3) The procedure to be adopted in connection with the tours of officers of the Forest Research Institute in provinces.
- (4) Supply of sleepers to Railways.

The views of the Board are recorded below :—

(1) The Board agreed that in future provinces should only submit a summary of their research report for inclusion in Part II of Forest Research in India. In provinces where there is a Working Plan Conservator such summary of the silvicultural report should be prepared by him.

(2) The Board discussed Mr. Hopwood's note, published as Appendix II, on this subject and decided that, although substitutes for timber cannot be disregarded there is no reason to suppose that the general demand for timber in the future is likely to be less than in the past. Efforts must, however, be made to popularise the use of timber and to place timber on the market in such sizes and condition as the purchaser requires.

(3) It was pointed out that in accordance with the existing orders the President, Forest Research Institute, informs the Heads of Provincial Forest Department concerned whenever a Research Officer proposes to tour in areas under its jurisdiction. It was now suggested that once the Head of the Department had sanctioned a special investigation involving several visits to his province his further approval of tours need not be obtained by the President, Forest Research Institute. An intimation should, however, be sent to the Head of the Department as soon as the officer proceeds on tour. In these circumstances Research Officers might be permitted to correspond direct with Divisional Forest Officers with the President's authority.

These proposals were approved and accepted by all members of the Board.

(4) Various difficulties experienced by members of the Board in dealing with sleeper supplies were discussed and in view of the recommendation recently expressed by the Railway Board for closer co-operation between the Forest and Railway Departments, the Board considered that Heads of Forest Departments should be given greater facilities for meeting members of the Sleeper Pool Committee to explain their difficulties.

At the conclusion of the proceedings Mr. Canning, Chief Conservator of Forests, United Provinces, on behalf of all members of the Board thanked the Inspector General of Forests and all members of the Forest Research Institute for making their stay at Dehra Dun both instructive and comfortable. He said all members of the Board were of opinion that the retention of the post of Inspector General of Forests was most essential for the general welfare of forestry in India (hear, hear) and they considered it was held at present by one who held the confidence of all of them as well as, he believed, of the Government of India. (Applause).

Mr. Canning was sure they would all on return to their respective provinces take such action as was necessary on matters which had been brought to their notice in the meetings of the Board. They had all had the advantage of seeing the work being done in the Forest Research Institute and meeting the staff of the Institute and he was sure they would appreciate the work which was being done and co-operate for the advancement of forestry in their respective provinces. He trusted that the Inspector General of Forests would continue to look after the promotion of scientific forestry throughout the whole of India.

After an expression of reciprocal thanks from the Inspector General of Forests for the hearty co-operation of all members of the Board the meeting was adjourned *sine die*.

APPENDIX I.

LIST "A".

For publication in the Handbook of the Empire Forestry Association.

Scientific name.	Trade name.	Other common names.
<i>Adina cordifolia</i> . . .	haidu . . .	hnaw (Burma).
<i>Albizia lebbek</i> . . .	koldko . . .	siris, East Indian walnut.
<i>Anogeissus acuminata</i> . . .	yon.	
<i>Bombax insigne</i> . . .	didu.	
<i>Bombax malabaricum</i> . . .	semul . . .	letpan (Burma).
<i>Buzus sempervirens</i> . . .	box . . .	European box, common box.
<i>Calophyllum spectabile</i> . . .	lalehini.	
<i>Calophyllum tomentosum</i> . . .	poon.	
<i>Canarium euphyllum</i> . . .	white dhup.	
<i>Carapa moluccensis</i> . . .	kyana . . .	pussur, kyat-hnan (Burma).
<i>Cedrela</i> spp. . . .	toon . . .	red cedar, Moulmein cedar, thilkado (Burma).
<i>Cedrus deodara</i> . . .	deodar . . .	Indian cedar, Himalayan cedar.
<i>Chloroxylon swietenia</i> . . .	Indian satinwood . . .	
<i>Olukraia tubularis</i> . . .	chickmasy . . .	yinma (Burma), golden mahogany.
<i>Dalbergia cultrata</i> . . .	yindalk.	
<i>Dalbergia latifolia</i> . . .	Indian rosewood . . .	Bombay blackwood, shisum (Bombay).
<i>Dalbergia oliveri</i> . . .	tamalan.	
<i>Dalbergia sissoo</i> . . .	sissoo . . .	shisham, tali.
<i>Diospyros ebenum</i> . . .	} obony . . .	kaluwara, karunkali.
<i>Diospyros melanoxylon</i> . . .		
<i>Diospyros marinorata</i> . . .	Andaman marble-wood.	Zebra wood.
<i>Dipterocarpus alatus</i> . . .	} guijun . . .	kanyin (Burma). mai yang (Siam), jarul.
<i>Dipterocarpus baudii</i> . . .		
<i>Dipterocarpus dyeri</i> . . .		
<i>Dipterocarpus grandiflorus</i> . . .		
<i>Dipterocarpus Kerrii</i> . . .		
<i>Dipterocarpus pilosus</i> . . .	} black dammar.	
<i>Dipterocarpus turbinatus</i> . . .		
<i>Dipterocarpus indicus</i> . . .	hollong.	
<i>Dipterocarpus macrocarpus</i> . . .	eng . . .	in.
<i>Dipterocarpus tuberculatus</i> . . .	white cedar.	
<i>Dysoxylum malabaricum</i> . . .	bakota.	
<i>Endospermum malaccense</i> . . .	salmon wood.	
<i>Eriolaena candollei</i> . . .		

LIST "A"—contd.

Scientific name.	Trade name.	Other common names.
<i>Fraxinus excelsior</i> . . .	ash.	
<i>Fraxinus floribunda</i> . . .	gamai . . .	yemane (Burma).
<i>Gmelina arborea</i> . . .	dhaman.	
<i>Grewia tiliacfolia</i> . . .	sundri . . .	pinle-kanazo (Burma).
<i>Heritiera</i> spp. . . .	thungan.	
<i>Hopsea odorata</i> . . .	Walnut.	
<i>Juglans regia</i> . . .		
<i>Lagerstroemia flos-reginae</i> . . .	jarul . . .	pyinma (Burma).
<i>Lagerstroemia hypoleuca</i> . . .	bontak . . .	nana.
<i>Lagerstroemia lanceolata</i> . . .	mesua . . .	penaga, gangaw, nahor.
<i>Mesua ferrica</i> . . .	champ . . .	champ, saga.
<i>Michelia champaca</i> . . .	thunwin.	
<i>Milletia pendula</i> . . .	mulberry.	
<i>Morus alba</i> . . .	lambu.	
<i>Morus lacugata</i> . . .	tavoy wood . . .	thingadu (Burma).
<i>Parashorca stellata</i> . . .	red dhup . . .	parishia.
<i>Parishia insignis</i> . . .	thitya . . .	
<i>Pentace burmanica</i> . . .	ingyin . . .	ingyin. Usually mixed indiscriminately with <i>Shorea obtusa</i> under the name of <i>thitya-ingyin</i> (Burma).
<i>Pentacme suaveis</i> . . .		
<i>Planchonia andamanica</i> . . .	red bombway.	
<i>Podocarpus</i> spp. . . .	thutmin.	
<i>Pterocarpus dulbergioides</i> . . .	Andaman padauk . . .	
<i>Pterocarpus macrocarpus</i> . . .	Burma padauk.	
<i>Pterocarpus santalinus</i> . . .	red sanders . . .	
<i>Santalum album</i> . . .	sandalwood.	
<i>Shorea obtusa</i> . . .	thitya . . .	thitya. Usually mixed indiscriminately with <i>Pentacme suaveis</i> under the name of <i>thitya-ingyin</i> (Burma).
<i>Shorea robusta</i> . . .	sal	
<i>Sterculia campanulata</i> . . .	papita . . .	sarobyia (Burma).
<i>Swietenia mahagoni</i> . . .	mahogany.	
<i>Swietenia macrophylla</i> . . .	teak.	
<i>Tectona grandis</i> . . .	white chuglam . . .	Indian silver-grey wood. (This name is only applied to the darker silver-grey wood of the centre of the tree).
<i>Terminalia dialata</i> . . .		
<i>Terminalia mani</i> . . .	black chuglam.	
<i>Terminalia myriocarpa</i> . . .	hollock . . .	panisaj.
<i>Terminalia procera</i> . . .	white bombway . . .	badam.
<i>Terminalia tomentosa</i> . . .	laurel . . .	asma, sain, asan, mutti, tauk-kyan (Burma).
<i>Xylia dolabriformis</i> . . .	pyinkado.	

LIST "B."

For Publication as a Bulletin of the F. R. I.

Scientific name.	Trade name.	Other common names.
<i>Abies pindrow</i> . . .	fir.	
<i>Acacia arabica</i> . . .	babul . . .	kikar.
<i>Acacia catechu</i> . . .	euteh . . .	kharr.
<i>Acer</i> spp. . . .	maple . . .	kapasi.
<i>Acrocarpus fraxinifolius</i> . . .	mundani.	
<i>Adina cordifolia</i> . . .	haldu . . .	hnaw (Burma).
<i>Albizia lebbek</i> . . .	kokko . . .	siris, east Indian walnut.
<i>Albizia odoratissima</i> . . .	black siris . . .	kala siris, thitmagyi (Burma).
<i>Albizia procera</i> . . .	white siris . . .	safed siris, sit, thitpyu (Burma).
<i>Alnus nepalensis</i> . . .	alder . . .	utis.
<i>Alstonia scholaris</i> . . .	shaitan wood.	
<i>Altingia excelsa</i> . . .	jutili.	
<i>Amoora wallichii</i> . . .	} amoora . . .	aukhinzani (Burma).
<i>Amoora spectabilis</i> . . .		
<i>Anisoptera glabra</i> . . .	kaunghmu.	
<i>Anogeissus acuminata</i> . . .	yon.	
<i>Anogeissus latifolia</i> . . .	axle-wood . . .	dhaura, balli.
<i>Anthocephalus cadamba</i> . . .	kadam . . .	mau-jettan-she (Burma).
<i>Artocarpus chaplasha</i> . . .	chaplash . . .	taung peing.
<i>Artocarpus hirsuta</i> . . .	aini.	
<i>Artocarpus integrifolia</i> . . .	jack.	
<i>Artocarpus lakoochn</i> . . .	lakooch . . .	myauklok (Burma).
<i>Azadirachta indica</i> . . .	neon.	
<i>Berrya ammonilla</i> . . .	Trincomalee wood . . .	petwin (Burma).
<i>Betula</i> spp. . . .	birch . . .	
<i>Bischofia javanica</i> . . .	bishop wood.	
<i>Bombax insignis</i> . . .	didu.	
<i>Bombax malabaricum</i> . . .	semul . . .	letpan (Burma).
<i>Boswellia serrata</i> . . .	salai.	
<i>Bursera serrata</i> . . .	Indian red pear.	
<i>Buxus sempervirens</i> . . .	box . . .	European box, common box.
<i>Calophyllum inophyllum</i> . . .	bobbi . . .	wuna.
<i>Calophyllum spectabile</i> . . .	lalehini.	
<i>Calophyllum tomentosum</i> . . .	poon.	
<i>Canarium euphyllum</i> . . .	white dhup.	
<i>Carallia lucida</i> . . .	maniwaga.	
<i>Carapa moluccensis</i> . . .	kyana . . .	pussur, kyat-hnan (Burma).
<i>Castanopsis hystrix</i> . . .	Indian chestnut . . .	katus.
<i>Cedrela</i> spp. . . .	toon . . .	red cedar, Moulmein cedar, thitkado (Burma).
<i>Cedrus deodara</i> . . .	deodar . . .	Indian cedar, Himalayan cedar.
<i>Chloroxylon swietenia</i> . . .	Indian satinwood	buruta, mutirai.
<i>Chukrasia tabularis</i> . . .	chickraasy . . .	{ yinna (Burma). golden mahogany.
<i>Cinnamomum cecicodaphne</i> . . .	cinnamon . . .	
<i>Cordia fragrantissima</i> . . .	sandawa.	
<i>Cordia macleodii</i> . . .	ladang.	
<i>Cryptomeria japonica</i> . . .	suji.	
<i>Cullenia excelsa</i> . . .	karani.	

LIST " B "—contd.

Scientific name.	Trade name.	Other common names.
<i>Cupressus torulosa</i> . . .	cypress.	
<i>Cynometra polyandra</i> . . .	pung.	
<i>Dalbergia cultrata</i> . . .	yindail.	
<i>Dalbergia latifolia</i> . . .	Indian rosewood .	Bombay blackwood, shi- sum (Bombay).
<i>Dalbergia oliveri</i> . . .	tamalan.	
<i>Dalbergia sissoo</i> . . .	sissoo . . .	shisham, tali.
<i>Dichopsis elliptica</i> Syn. <i>Palaeum ellipticum</i>).	pali	
<i>Dichopsis polyantha</i> . . .	tali.	
<i>Diospyros ebenum</i> . . .	} obony . . .	kaluwara, karunkail.
<i>Diospyros melanoxylon</i> . . .		
<i>Diospyros marmorata</i> . . .	Andaman marble- wood.	robra wood.
<i>Dipterocarpus alatus</i> . . .	} gurjun . . .	kanyin (Burma), apitong (Philippines) maiyang (Siam), jarul.
<i>Dipterocarpus baudi</i> . . .		
<i>Dipterocarpus dyeri</i> . . .		
<i>Dipterocarpus grandiflorus</i> . . .		
<i>Dipterocarpus incanus</i> . . .		
<i>Dipterocarpus kerrii</i> . . .		
<i>Dipterocarpus pilosus</i> . . .	} black dammar.	
<i>Dipterocarpus turbinatus</i> . . .		
<i>Dipterocarpus indicus</i> . . .	hollong.	
<i>Dipterocarpus macrocarpus</i> . . .	ong . . .	in.
<i>Dipterocarpus tuberculatus</i> . . .	lampati.	
<i>Duabanga sonneratioides</i> . . .	white cedar.	
<i>Dysoxylum malabaricum</i> . . .	bakota.	
<i>Endospermum malaccense</i> . . .	salmon wood.	
<i>Eriolucna candollei</i> . . .	jaman.	
<i>Eugenia spp.</i> . . .	ash.	
<i>Frazinus excelsior</i> . . .	ash.	
<i>Frazinus floribunda</i> . . .	ash.	
<i>Gardenia latifolia</i> . . .	gardenia.	
<i>Gluta tavoyana</i> . . .	} gluta . . .	chay (Burma).
<i>Gluta travancorica</i> . . .		
<i>Gmelina arborea</i> . . .	gamari . . .	yemang (Burma).
<i>Grevia tiliaefolia</i> . . .	dhaman.	
<i>Hardwickia binata</i> . . .	anjan.	
<i>Hardwickia pinnata</i> . . .	pinoy.	
<i>Heritiera spp.</i> . . .	sundri . . .	pinle-kanazo (Burma).
<i>Holoptelea integrifolia</i> . . .	kanju . . .	pappi.
<i>Houatium tomentosum</i> . . .	Burma lancowood .	myaukehaw (Burma).
<i>Hopea odorata</i> . . .	thiingan.	
<i>Hopea parviflora</i> . . .	hopea.	
<i>Hymenodictyon excelsum</i> . . .	kuthan . . .	baurang.
<i>Juglans regia</i> . . .	walnut.	
<i>Lagerstroemia flos-reginae</i> . . .	} jarul . . .	pyinma (Burma).
<i>Lagerstroemia hypoleuca</i> . . .		
<i>Lagerstroemia lanceolata</i> . . .	bonteak . . .	nana.
<i>Lagerstroemia parviflora</i> . . .	londi . . .	nandi, sidak, dauri.
<i>Lagerstroemia tomentosa</i> . . .	leza.	
<i>Lophopetalum wightianum</i> . . .	banati.	
<i>Mangifera spp.</i> . . .	mango.	
<i>Melanorrhoea usitata</i> . . .	thitsi.	

LIST "B"—*contd.*

Scientific name.	Trade name.	Other common names.
<i>Melia azedarach</i> . . .	Persian lilac.	
<i>Melia composita</i> . . .	Malabar neem wood	
<i>Mesua ferrea</i> . . .	mesua . . .	penaga, gangaw, nahor.
<i>Michelia champaca</i> . . .	champ . . .	saga .
<i>Millettia pendula</i> . . .	thinwin.	
<i>Mitragyna diversifolia</i> . . .	binga.	
<i>Mitragyna parvifolia</i> . . .	kaim.	
<i>Morus</i> sp. . . .	mulberry.	
<i>Odina woderi</i> (<i>Lannea grandis</i>)	jhingan.	
<i>Olea cuspidata</i> . . .	olive . . .	kow.
<i>Ougeinia dalbergioides</i> . . .	sandan.	
<i>Palaequium ellipticum</i> , (Syn. <i>Dichopsis elliptica</i>).	pali.	
<i>Parashorea stellata</i> . . .	Tavoy wood . . .	thingadu (Burma).
<i>Parishia insignis</i> . . .	red dhup . . .	Parishia.
<i>Parrotia jacquemontiana</i> . . .	parotia . . .	
<i>Pentace burmanica</i> . . .	thitya . . .	
<i>Pentacme suavis</i> . . .	ingyin . . .	ingyin. Usually mixed in
<i>Phoebe hainestiana</i> . . .	bonsum.	discriminately with <i>Shorea</i>
<i>Piccu morinda</i> . . .	spruco.	<i>obtus</i> under the name of
		<i>thitya-ingyin</i> (Burma).
<i>Pinus excelsa</i> . . .	blue pine . . .	kail.
<i>Pinus longifolia</i> . . .	chir . . .	chil, long-leaved pine.
<i>Planchonia andamanica</i> . . .	red bombway.	
<i>Platanus orientalis</i> . . .	Eastern plane.	
<i>Podocarpus</i> spp. . . .	thitmin.	
<i>Populus euphratica</i> . . .	Indian poplar . . .	bahan poplar.
<i>Potium serratum</i> (Syn. <i>Bursera serrata</i>).	Indian red pear.	
<i>Pterocarpus dalbergioides</i> . . .	Andaman padauk.	
<i>Pterocarpus macrocarpus</i> . . .	Burma padauk.	
<i>Pterocarpus marsupium</i> . . .	bijasal.	
<i>Pterocarpus santalinus</i> . . .	red sanders . . .	
<i>Sageraea elliptica</i> . . .	chooi . . .	Andaman bow wood.
<i>Salix</i> spp. . . .	Indian willow.	
<i>Santalum album</i> . . .	sandalwood.	
<i>Schima wallichii</i> . . .	chilauni.	
<i>Schleichera trijuga</i> . . .	kusum . . .	gyo (Burma).
<i>Shorea assamica</i> . . .	makai.	
<i>Shorea obtusa</i> . . .	thitya . . .	thitya. Usually mixed in
		discriminately with <i>Pen-</i>
		<i>tacme suavis</i> under the
		name of <i>thitya-ingyin</i>
		(Burma).
<i>Shorea robusta</i> . . .	sal.	
<i>Sideroxylon longepetiolatum</i> . . .	lambapatti.	
<i>Sterculia campanulata</i> . . .	jupifa . . .	sambya (Burma).
<i>Sweetenia mahagoni</i> . . .	} mahogany.	
<i>Swietenia macrophylla</i> . . .		
<i>Swintonia floribunda</i> . . .	taungthayet.	shide (Burma).
<i>Tamarix articulata</i> . . .	farash.	
<i>Taxus baccata</i> . . .	yow . . .	common yow, European yow.
<i>Tectona grandis</i> . . .	teak.	
<i>Terminalia bialata</i> . . .	white chuglam . . .	Indian silver-grey wood.
		(This name is only applied
		to the darker silver-grey
		wood of the centre of the
		tree).

List " B "—concl'd.

Scientific name.	Trade name.	Other common names.
<i>Terminalia belerica</i> . .	babera.	
<i>Terminalia manii</i> . .	black chuglam.	
<i>Terminalia myriocarpa</i> . .	hollock . .	panisaj.
<i>Terminalia paniculata</i> . .	kundal.	
<i>Terminalia procera</i> . .	white bombway	badam.
<i>Terminalia tomentosa</i> . .	laurol . .	asna, sain, asan, mutli, tauk- kyan (Burma).
<i>Tetrameles nudiflora</i> . .	baing.	thit pok (Burma).
<i>Trewia nudiflora</i> . .	gutol . .	pitoli.
<i>Vateria indica</i> . .	vellapinoy . .	dhup.
<i>Xylia dolabriformis</i> . .	pyinkado.	
<i>Xylia xylocarpa</i> . .	irul.	

APPENDIX II.

THE INFLUENCE OF THE GROWING USE OF SUBSTITUTES FOR
TIMBER UPON FOREST POLICY.

Included in the provisional Agenda for the meeting of the Board of Forestry to be held in October 1931, there is no reference at all to the increasing employment of substitutes for wood in nearly all its uses. For the Forest Department in Burma, this increasing use of substitutes is a question of the very greatest importance and is a menace and a threat to Forestry as practised in the Province, though it is not only the Province of Burma which is affected in this way but all countries which are at all interested in the production of hardwoods. (*The remarks in this Note apply mainly to hardwoods. It is, generally speaking, hardwoods that are suffering from the introduction of substitutes.*)

2. In "Forestry, An Economic Challenge" by Arthur Newton Pack (page 2) it is stated that "the use of practical substitutes for wood has been gradually decreasing our *per capita* consumption of lumber to a point almost half of what it used to be". This may be true for the United States of America; in Burma, although the increasing use of substitutes has not reduced the consumption of hardwoods to anything like the same extent, the use of teak and other hardwoods has been very much affected by the introduction of substitutes. Examples of this may be seen in the more advanced parts of the Province notably, in the big towns. Till recently all the bridges on the roads between Rangoon and Mandalay and Rangoon and Prome were entirely constructed of wood. They have all been replaced by bridges of iron or reinforced concrete. Elsewhere in the world a wooden bridge is now a rarity.

3. Till recently, the oil fields of Burma used to consume very large quantities of timber in the construction of derrick, aqueducts and structures to carry pipe lines across streams. Nowadays these are all made of reinforced concrete. The Engineer knows that if he builds a structure of reinforced concrete, it will be in even better condition 100 years hence than on the day he built it and even in an oil field there is no danger from fire.

4. Formerly all houses in Rangoon were made of teak roofs, floors and walls. It is exceptional to find timber used in the construction of houses nowadays. In Rangoon Government recently spent over Rs. 124 lakhs on the construction of the buildings for the Rangoon University - practically the only timber used on these buildings was the scaffolding. The buildings are all reinforced concrete and most of the floors are made of some composition. The fence posts round the whole estate are either iron or reinforced concrete. Some of the staircases and some of the bedroom floors are made of teak, but it can be said with truth that practically speaking no timber has been used in the construction of these buildings. (Even the window frames are of metal). The same is true with regard to other buildings which are being erected in Burma. This is partly due to Municipal bye-laws which prohibit the erection of wooden buildings inside municipal limits. Elsewhere there is a reluctance to put up wooden buildings because Insurance companies charge higher premiums. In the new offices for the Rangoon Port Trust, in the immense new wharves, in the new offices for the Irrawaddy Flotilla Company and the new bank buildings which have recently been constructed, almost the only timber employed has been used in the manufacture of the office furniture; much of the office furniture is made of teak. The old barracks in Rangoon were entirely made of timber—roofs, walls and floors—in the new barracks timber is conspicuous by its absence. No doubt similar conditions prevail all over the world.

5. The effect of recent railway accidents during the year has been to discourage still further the use of wood in the manufacture of railway carriages. In Burma it has been found that the sole bars made of teak on the goods wagons of the Burma Railways are not equal to the strain. (Sole bars are beams of teak or metal running longitudinally on each side of the wagon). These teak bars have been cracking

and breast me with, in quite a frequency and on an account of having a good rest in Jerusalem. It has been indeed a rough one, though all in all, in 1,400 or more years, I do not think I have suffered more at any one time.

to it was noted that the battle of the Marston of the King of Saxony which
 called at the moment of the battle of the Marston of the King of Saxony.

7. In the records district in Upper Burma it apparently pays the Paddy Works Department to transport rice for the rail station, but not for a distance and it is then not paid for transport to the station for more than one mile from the station.

Learn the new machine, the wheel of the Press. For a 50¢ book on the subject, please send 10¢ to the publisher.

I am to the collection of the "F. D. Ives" collection, dated July 14, 1971, and the collection of the "F. D. Ives" collection, dated July 14, 1971, of the collection of the "F. D. Ives" collection, dated July 14, 1971.

The above information reflects the fact that the majority of the respondents are male, white, married, and have a college degree or higher. The majority of the respondents are also employed full-time.

[illegible][illegible]

1960-1961, 1962-1963, 1964-1965, 1966-1967, 1968-1969, 1970-1971, 1972-1973, 1974-1975, 1976-1977, 1978-1979, 1980-1981, 1982-1983, 1984-1985, 1986-1987, 1988-1989, 1990-1991, 1992-1993, 1994-1995, 1996-1997, 1998-1999, 2000-2001, 2002-2003, 2004-2005, 2006-2007, 2008-2009, 2010-2011, 2012-2013, 2014-2015, 2016-2017, 2018-2019, 2020-2021, 2022-2023, 2024-2025, 2026-2027, 2028-2029, 2030-2031, 2032-2033, 2034-2035, 2036-2037, 2038-2039, 2040-2041, 2042-2043, 2044-2045, 2046-2047, 2048-2049, 2050-2051, 2052-2053, 2054-2055, 2056-2057, 2058-2059, 2060-2061, 2062-2063, 2064-2065, 2066-2067, 2068-2069, 2070-2071, 2072-2073, 2074-2075, 2076-2077, 2078-2079, 2080-2081, 2082-2083, 2084-2085, 2086-2087, 2088-2089, 2090-2091, 2092-2093, 2094-2095, 2096-2097, 2098-2099, 2100-2101, 2102-2103, 2104-2105, 2106-2107, 2108-2109, 2110-2111, 2112-2113, 2114-2115, 2116-2117, 2118-2119, 2120-2121, 2122-2123, 2124-2125, 2126-2127, 2128-2129, 2130-2131, 2132-2133, 2134-2135, 2136-2137, 2138-2139, 2140-2141, 2142-2143, 2144-2145, 2146-2147, 2148-2149, 2150-2151, 2152-2153, 2154-2155, 2156-2157, 2158-2159, 2160-2161, 2162-2163, 2164-2165, 2166-2167, 2168-2169, 2170-2171, 2172-2173, 2174-2175, 2176-2177, 2178-2179, 2180-2181, 2182-2183, 2184-2185, 2186-2187, 2188-2189, 2190-2191, 2192-2193, 2194-2195, 2196-2197, 2198-2199, 2200-2201, 2202-2203, 2204-2205, 2206-2207, 2208-2209, 2210-2211, 2212-2213, 2214-2215, 2216-2217, 2218-2219, 2220-2221, 2222-2223, 2224-2225, 2226-2227, 2228-2229, 2230-2231, 2232-2233, 2234-2235, 2236-2237, 2238-2239, 2240-2241, 2242-2243, 2244-2245, 2246-2247, 2248-2249, 2250-2251, 2252-2253, 2254-2255, 2256-2257, 2258-2259, 2260-2261, 2262-2263, 2264-2265, 2266-2267, 2268-2269, 2270-2271, 2272-2273, 2274-2275, 2276-2277, 2278-2279, 2280-2281, 2282-2283, 2284-2285, 2286-2287, 2288-2289, 2290-2291, 2292-2293, 2294-2295, 2296-2297, 2298-2299, 2300-2301, 2302-2303, 2304-2305, 2306-2307, 2308-2309, 2310-2311, 2312-2313, 2314-2315, 2316-2317, 2318-2319, 2320-2321, 2322-2323, 2324-2325, 2326-2327, 2328-2329, 2330-2331, 2332-2333, 2334-2335, 2336-2337, 2338-2339, 2340-2341, 2342-2343, 2344-2345, 2346-2347, 2348-2349, 2350-2351, 2352-2353, 2354-2355, 2356-2357, 2358-2359, 2360-2361, 2362-2363, 2364-2365, 2366-2367, 2368-2369, 2370-2371, 2372-2373, 2374-2375, 2376-2377, 2378-2379, 2380-2381, 2382-2383, 2384-2385, 2386-2387, 2388-2389, 2390-2391, 2392-2393, 2394-2395, 2396-2397, 2398-2399, 2400-2401, 2402-2403, 2404-2405, 2406-2407, 2408-2409, 2410-2411, 2412-2413, 2414-2415, 2416-2417, 2418-2419, 2420-2421, 2422-2423, 2424-2425, 2426-2427, 2428-2429, 2430-2431, 2432-2433, 2434-2435, 2436-2437, 2438-2439, 2440-2441, 2442-2443, 2444-2445, 2446-2447, 2448-2449, 2450-2451, 2452-2453, 2454-2455, 2456-2457, 2458-2459, 2460-2461, 2462-2463, 2464-2465, 2466-2467, 2468-2469, 2470-2471, 2472-2473, 2474-2475, 2476-2477, 2478-2479, 2480-2481, 2482-2483, 2484-2485, 2486-2487, 2488-2489, 2490-2491, 2492-2493, 2494-2495, 2496-2497, 2498-2499, 2500-2501, 2502-2503, 2504-2505, 2506-2507, 2508-2509, 2510-2511, 2512-2513, 2514-2515, 2516-2517, 2518-2519, 2520-2521, 2522-2523, 2524-2525, 2526-2527, 2528-2529, 2530-2531, 2532-2533, 2534-2535, 2536-2537, 2538-2539, 2540-2541, 2542-2543, 2544-2545, 2546-2547, 2548-2549, 2550-2551, 2552-2553, 2554-2555, 2556-2557, 2558-2559, 2560-2561, 2562-2563, 2564-2565, 2566-2567, 2568-2569, 2570-2571, 2572-2573, 2574-2575, 2576-2577, 2578-2579, 2580-2581, 2582-2583, 2584-2585, 2586-2587, 2588-2589, 2590-2591, 2592-2593, 2594-2595, 2596-2597, 2598-2599, 2600-2601, 2602-2603, 2604-2605, 2606-2607, 2608-2609, 2610-2611, 2612-2613, 2614-2615, 2616-2617, 2618-2619, 2620-2621, 2622-2623, 2624-2625, 2626-2627, 2628-2629, 2630-2631, 2632-2633, 2634-2635, 2636-2637, 2638-2639, 2640-2641, 2642-2643, 2644-2645, 2646-2647, 2648-2649, 2650-2651, 2652-2653, 2654-2655, 2656-2657, 2658-2659, 2660-2661, 2662-2663, 2664-2665, 2666-2667, 2668-2669, 2670-2671, 2672-2673, 2674-2675, 2676-2677, 2678-2679, 2680-2681, 2682-2683, 2684-2685, 2686-2687, 2688-2689, 2690-2691, 2692-2693, 2694-2695, 2696-2697, 2698-2699, 2700-2701, 2702-2703, 27

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9. In 1877 I became "free to go." It had been my intention to leave the Bureau at the end of the year, but I was unable to do so until the following year. I went to Harvard University, where I remained until 1880. During this time I continued to work for the Bureau, but I was not able to do so as much as I would have liked to.

* The first 14 copies listed above are deposited with the U.S. National Archives.

American Journals dealing with Forestry. There is no doubt that the substitution for timber of other substances such as steel, concrete and plastics has gone far farther in America than elsewhere, but the introduction of those substitutes into Burma is now making very great headway. There are now very few uses of hardwoods for which there does not exist a better or a cheaper substitute.

10. What effect should this increasing use of substitutes have on our forest policy? In endeavouring to answer this question it must be remembered that there is a very great difference between Burma and the other Provinces of India. Burma is a timber-exporting country whereas India is a timber-importing country. If, in Burma, money is spent on plantations or works of improvement to increase the growing stock, it is not to produce timber for the internal requirements of the country; it is with the object of maintaining or increasing the exports of teak to other countries of the world, i.e., it is purely a commercial proposition. During the last five years Burma has exported on the average 163,000 tons of teak to India and other countries. For the years 1925-1929 the amount was 234,000 tons. The amount exported has therefore dropped by about 71,000 tons per annum or a total of 355,000 (converted) tons in five years. In other words we have unwillingly retained in the Province some 355,000 (converted) tons in the last five years. The above large amounts of timber were all grown in natural forest. If we continue to make plantations or undertake works of improvement which should reduce working costs and cheapen teak, it is with the object of maintaining or increasing the amounts to be exported to India and other countries of the world.

11. It is to be hoped that the drop in the export of teak from Burma to India is temporary and due to the general slump in jute, cotton, tea, lac and other products. The natural increase in population in India may well increase the demand for Burma teak for many decades but the future price is extremely uncertain. Competition by substitutes will tend to lower the price at which Burma can sell; it is therefore impossible to forecast financial results and such forecasts are imperative in a commercial enterprise, otherwise it becomes a pure gamble. There is nothing to be said in favour of continuing the extensive planting of teak in Burma for export if it is not a commercial money-paying proposition but only a financial gamble.

12. *Plantations.*—It is within the last few years that the menace of substitutes has increased so greatly. (From the point of view of the Forest Department in Burma "substitutes" include not only such material as steel, concrete, etc., but inferior timbers other than teak). Even if the produce of our teak plantations was in any way comparable with the teak produced in our natural forest, are we justified in continuing to plant some 4,000 acres a year at a cost of several lakhs annually? If we continue planting at the present rate, taking the final yield at 50 tons per acre, we shall have increased our output when these plantations are mature by 200,000 tons of teak annually or 20 million tons in 100 years. Who will use all this teak? Improvements in the manufacture of substitutes may be noticed every day and by A.D. 2050, when these plantations are mature, substitutes will have improved out of all knowledge. In certain reserved forests in Burma for which figures are available (area 16,000 square miles) as a result of enumerations there are now standing upwards of 4,000,000 *pyinkado* (*Xylia dolabriformis*) trees 6 feet in girth and over and in the remaining 19,000 square miles of reserved forests and 114,000 square miles of unclassified forests there are also vast supplies of mature *pyinkado*. Much of this area is classed as inaccessible, but if there was any demand for the timber, it would be extracted. We still continue to make plantations of *pyinkado* although last year we only planted 463 acres with this species.

13. In making these plantations we are not planting up barren areas, but we are destroying good natural forest in order to make the plantations and it frequently happens that the plantations are of less value than the forest which they have replaced. In Burma we have already made about 123,000 acres of plantations plus 14,268 acres written off as failures at a total cost of over Rs. 42,00,000. This figure is the bare cost of planting and tending; it does not include any overhead charges such as the pay and pensions of the officers. Without these plantations a

heavy reduction in staff would be possible. Over this area of 147,000 acres we have destroyed the natural growth consisting very largely of teak and bamboo forest and have replaced or attempted to replace it by pure teak. It may very well happen that the bamboo which we are destroying will have a very great value in future, though it must be admitted that the possible value of the bamboo area thrown out of production by teak planting is negligible compared with the vast areas of unused bamboo. Bamboo yields cellulose and from cellulose not only paper pulp is manufactured but silk, explosives, alcohol, sugar and very many other commodities. Two large leases for the manufacture of cellulose from bamboos have been granted in Burma. The persons to whom the leases have been issued are nothing if not optimistic and freely prophesy that in some 20 years it will not be the rice or the timber or the lead or tin of Burma which will constitute the most valuable exports of the Province but it will be bamboo pulp.

14. It is not only our forest policy regarding making teak plantations that is affected by this preference for substitutes. In the Federated Shan States we have planted some 1,600 acres with yomau (*Gmelina arborea*) with the object of providing pitprops for the future needs of a big silver and lead mine. The cost of these plantations at 5 years old is Rs. 280 per acre excluding cost of staff and all overhead charges. There is no guarantee that the mine will use these trees when they are mature as pitprops and it is now extremely unlikely that it will use them. Already it has begun to use steel and other materials. The mine has suffered very greatly from a fire and it would be very ill-advised if it continues to use wooden pitprops. These plantations are not successful and all further planting here has been stopped. Latest reports indicate that owing to continued insect attack, these plantations will be shortly non-existent.

15. I am of opinion that we should face the facts, agreeable or otherwise. Continuity of supplies will be useless if the supplies are no longer saleable. I have been much criticised by senior officers for drawing attention to this danger from substitutes and I think that the attitude of many forest officers and timber traders in this connection is a wrong one. Early this year Mr. W. O. Woodward, Chairman of the Saw-milling and Wood-working Section of the Timber Trades Federation, gave a lecture entitled "Timber and its Substitutes". At the close of the lecture, Mr. E. P. Tutsall, President of the Federation, in a speech stated that "he had been particularly interested to come that evening because he hoped to hear something about substitutes, but it had been really shown that there were no substitutes". This attitude will not help us.

16. In the past one expected a Forest Officer to be conservative and to say that he was conservative was the highest praise. Nowadays it is essential that a Forest Officer must be adaptable. Where substitutes are of more utility and their use is economically justified, it is like trying to roll back the tides to endeavour to stop their use. To say that "Forest Policy must guarantee continuity with a fixed aim from which no deviation can be allowed without compelling reasons" will not help us. We must be prepared to meet the menace of substitutes by altering our policy. In Burma we have some 35,000 square miles of reserved forests; over a large part of this area the sound of the axe has never been heard. We have also some 114,000 square miles of unclassed forests. The relatively much larger area of natural forest in Burma compared with India affects the question of planting in Burma profoundly.

17. The increased use of substitutes must have a very great effect on our forest policy, as there is every reason to anticipate a decrease in demand for teak and other timber. Further, all timber-importing countries of the world are now setting their house in order in forestry matters and by A. D. 2050 when our plantations are mature there will be a very much smaller export demand for the hardwoods of Burma. After some sixty years of scientific Forest Management, the effect of the improvement of the forests and increased production of timber in the province of India is already noticeable.

The following tables are of interest :—

The total consumption of indigenous timbers other than teak used in Carriage and Wagon Shops in India during 1927-28 to 1932-33 was as follows :—

Total consumption of indigenous timbers other than teak used in Carriage and Wagon Shops in India.

	Tons, log.	
1927-28	9,800	(20 per cent. of grand total.)
1928-29	14,200	(31 per cent. of grand total.)
1930-31	17,000	(40 per cent. of grand total.)
1931-32	14,000	(48 per cent. of grand total.)
1932-33	15,000	(54 per cent. of grand total.)

and the total amount of timber consumed in Carriage and Wagon Shops was as follows :—

	Tons, log.	Porcentage of Total.	
		Burma Tonk.	Indian Teak and Indigenous Timbers.
1927-28	34,000	60	31
1928-29	Not available
1929-30	45,000	57	43
1930-31	42,000	50	50
1931-32	20,000	40	60
1932-33	28,000	36	64

18. The increase in the use of substitutes may have less influence on the forest policy of a timber-importing country than in the case of a timber-exporting country so far as questions regarding expenditure with the object of increasing the yield by means of plantations or works of improvement are concerned ; in fact it may be argued that an increased yield and the consequence of an increased yield, namely, cheap timber, is the best method of combating substitutes.

19. In framing our Forest Policy we must bear in mind that if any of our rules result in making the price of timber higher to the consumer, we are helping substitutes to win the battle and we must consider the necessity for retaining such rules. We must remember that (hardwoods) timber is no longer a necessity—in most of its uses it is nowadays only a luxury—(though in India its chief role is that of a necessity between the mud and bamboo hut stage and the brick, stone and iron housing stage). Even as long ago as 1926, Sir Hugh Watson, Chief Conservator of Forests, Burma, wrote “ We had many wrong visions and enthusiasms as an after math of the War. Amongst others we envisaged the clear felling of our natural forests and the complete utilization of the crop. We have seen how vain was the vision. In the first place we were forced to realise that even if we managed to bring our whole stock to the market not more than 40 per cent. of it would have any market value and that many years of research would be required appreciably to increase this porcentage ”. We are much further removed from the complete utilization of our crop now than we were in 1926.

20. In November 1933 the Conservator of Forests, Utilization Circle, Burma, wrote “ Substitutes are many and varied but there will always be a need for all the wood the forests of the world can permanently produce ”. (I shall show later on that there is no “ need ” even for all the teak wood that the forests of the world can produce). In the past it has always been assumed that we shall be able

to sell all we grow and that therefore we should grow as much as possible. Our whole policy has been based on this assumption and on the bogey of the coming timber famine which has been continually preached in the past.

One of the most obvious ways of reducing the price of timber is to lower the rates of royalty charged by Government.

21. *Reduction in royalty rates.*—As the Government of Burma was of the opinion that cheap teak means that more teak is used whereas dear teak makes the engineer consider the alternative of using steel, concrete or cheaper timber, it was recognised that the most direct way of making teak cheaper was to reduce the rates payable as royalty. Last year the royalty rates paid by all lessees were reduced * 30 per cent.—“in order to assist the lessees in maintaining the market for teak by lowering the price and placing it on a competitive basis, the Government of Burma (Ministry of Forests) have decided to sanction the reduction by 30 per cent. of all royalty rates under long-term teak agreements.” This 30 per cent. reduction in royalty last year cost the Burma Government the sum of Rs. 14,50,000. By the words “competitive basis” the Burma Government meant that teak by being reduced in price would be better able to compete with substitutes and other timbers.

22. It must be admitted that action has not been very consistent in this matter. While the royalty rates have been reduced in order to maintain the market for teak by lowering the price and placing it on a competitive basis, the output of teak has been very heavily reduced and the better qualities and grades have been artificially withheld; this can only have the effect of increase or maintenance of price and encouragement of substitutes. Between the years 1921 and 1931, 202,000 teak trees which ordinarily would have been girdled were not girdled. In the year 1933 the total reduction in the number of trees girdled was 103,700 and 112,600 in 1934. A great many of these reductions are made at the request of the firms of teak lessees; some of the firms are heavily in arrears with the extraction of girdled trees.

23. Although the forests in the Thayetmye Division would yield according to the Working Plan estimate 17,300 teak trees per annum, these forests have never yet been worked and no attempt has ever been made to reap the vast stock of mature timber standing in the division. These forests are very accessible and there would be no difficulty in extraction. Recent Conferences of Conservators have opposed suggestions that these forests should be worked on the ground that, if they were worked, it would only increase the glut of teak in Rangoon.

24. Outside leased areas we have standing some 341,600 girdled teak trees which, though ripe for sale, we have made no attempt to sell owing to the fear that if this timber were thrown on the market it would decrease the price of teak.

25. In all leases for teak the standard of marketability has been raised from 10 or 15 cubic feet to 20 cubic feet so that lessees now may leave all logs 20 cubic feet and under in the jungle to be burnt.

26. The various expedients being tried in the Province to prevent prices falling to a lower level have taken curious forms. Recently I was inspecting large quantity of inferior teak timber which had been cleared off land which was being put to agriculture. I suggested that it should be sold but the Forest Officer who accompanied me was strongly opposed to this—he said that a quantity had already been burnt and it would be much better to let it all burn. If sold, the price obtained would not be very much (perhaps Rs. 35 per ton) and the timber would find its way to Rangoon and help to increase the glut of timber still further.

27. Any measures that have the effect of increasing the price of timber to the consumer must lead to an increased use of substitutes and although, from some points of view, a higher price for teak is very desirable, raising the price may have a disastrous effect.

28. The question of lowering the price of wood to compete with substitutes is vital and there are inconsistencies and dangers in the present position of Burma

* Para. 5 of Govt. of Burma, Forest Deptt., letter No. 25-1-33, dated 7th October 1934.

teak in this respect. Good quality teak is in danger of being withheld too much above the prices which the consumer is at present able to pay. If recovery is adequate, this policy may be justified but it can scarcely fail to encourage substitutes to some extent.

20. *Timbers other than teak.*—The royalty rates paid for timber other than teak have all been reduced some 20 per cent.

A royalty rate of Rs. 15 a ton on *pyinkado* in the round adds about 8 annas to the cost of each metre gauge sleeper. In the past the Burma Railways have imported metal sleepers in small quantities but even if wooden sleepers were not available at very cheap rates, it is probable that in Burma the Government could compel the Burma Railways to use wooden sleepers. The Railways will of course use wooden sleepers if they can obtain them appreciably cheaper than iron ones.

30. In 1928 for the whole of India there were 50,820,000 wooden sleepers and 36,470,000 metal sleepers whereas in 1932 wooden sleepers had increased in number by only 964,000 but metal sleepers had increased by 7,818,000.

31. Apart from high royalty rates there are other restrictions which are helping to win the battle for substitutes:—

Girth limits.—The forests in Burma are for the most part worked under the selection system and the minimum girth limits have in many cases been fixed quite arbitrarily by Working Plan Officers. Most of these minimum girths below which a tree may not be felled are very high. This is due to some confused idea that a high girth limit is necessary to ensure a sustained yield. These high girth limits increase the cost of extraction per ton and reduce the profits needlessly. For example, although the Working Plan Officer laid down a minimum girth limit of 7 feet for teak in the Mawku Working Circle, Upper Chindwin Forest Division, the Conservator of Forests, Working Plan Circle, fixed the girth limit at 8 ft. 6 in. Girdling officers kept a record of trees which, though they were 8' 6" in girth or over, were too unsound to girdle and it was found that no less than 48 per cent. of the trees which had reached the minimum girth limit could not be girdled because they would not yield a log. In addition, a very large proportion of the trees which were girdled were unsound. In most of the forests of Burma the minimum girth limit for teak is 7' 6" for moist forest and 6' 6" for dry forest. These limits are in general too high. Before teak reaches these limits it has usually begun to decay, as is evidenced to some extent by the fact that last year 78.3 per cent. of the logs extracted by the big firms of teak lessees (191,271 logs out of a total of 244,044) were classified as "refuse." The result of these high girth limits is not only that the timber is unsound but that a given area yields fewer trees and the cost of extraction is consequently heavier. Certain teak reserves are still being worked under a 10' girth limit.

Teak is durable and floats and is exceptionally easy and cheap to extract so that the effect of a high girth limit for teak does not very appreciably raise the cost of extraction, though it does raise it to some extent. With *pyinkado* and other heavy woods a high girth limit has a much greater effect on the cost of extraction.

32. If the minimum girth limits for teak are high, those for timber other than teak are much higher in proportion. It is not unusual to find that working plans prescribe a girth limit of 8 feet for *kanyin* (*Dipterocarpus alatus*) and a girth limit of 7' 6" for *pyinkado* (*Xylia dolabriformis*). For *in* (*Dipterocarpus tuberculatus*) a girth limit of 7' is frequently prescribed, but there is more than one instance of a 8' girth limit for *in*. In the Pyinmana Division the Working Plan lays down a girth of 8' for *pyinkado*, *kanyin*, *thingan* and *thingadu* and for all other species 7 feet. Similarly the Insein Divisional Working Plan prescribes 8' for *kanyin*, *kaungmu* and *thingan* and 7' for *pyinkado*, *pyinma* and *thitka*. One result of these high girth limits is that the ordinary trader finds that it is beyond the powers of his buffaloes to extract the big butt logs. Although if the girth of such logs exceeds 9' the royalty charged is only 50 per cent. of the ordinary royalty rate, it frequently happens that even with this inducement the trader is unable to

extract the logs. It cannot be to the advantage of Government to grow the timber to this size with the result that Government only receives half rate of royalty. A girth limit of 8 feet means that extraction is the very reverse of contemplated.

33. Appendix I of a Note on a tour of inspection in the forests of the Andaman Islands by O. G. Trevor, Esq., O.I.E., Inspector General to the Government of India. It is not only in Burma that these high minimum girths prevail. In the Andaman Islands in selection follings, the girth limits for *padauk* and *gurjan* (*kanyin*) are 9 feet, *white chuglam* 8 feet and others 7 feet and it may be that similar arbitrary high girths prevail elsewhere in India. In the case of the Andaman Islands it is estimated that *padauk* and *gurjan* require 120 years to reach 7 feet in girth and 150 years to reach 8 feet. To attain a girth of 9 feet they must therefore require at least 180 years. It is further estimated that in the case of *padauk* while growing from 7 feet to 8 feet, 5,443 trees will disappear and in the case of *gurjan* 9,886 trees. A girth limit of 9 feet for *padauk* and *gurjan* can only mean that a very large percentage of the growing stock is never reaped to attempt to grow trees to 9 feet in girth instead of say 7 feet in girth means a very heavy loss in the following way:—

- (1) Several thousand fewer trees reaped.
- (2) Trees of 9 feet in girth and above are normally very much more liable to be decayed or to yield defective logs than trees of 7 feet in girth.
- (3) Extraction work is less concentrated and consequently more expensive.
- (4) A 9 feet girth limit does not mean that all the trees extracted will have a girth limit of 9 feet—a very large percentage will prove to be over 9 feet in girth. Logs of heavy hardwoods over 8 feet in girth cannot be extracted except from very accessible places and even from accessible places extraction of these large logs is only possible in short lengths.
- (5) A high girth limit means a long rotation and a long rotation means that we only get about two crops off the ground in the time taken to yield three or four if a low girth limit is employed.

At an Informal Conference of Forest Officers held at Maymyo on the 27th June 1934, it was unanimously resolved that "The revision of girth limits should be taken up at once and its effect studied in all its aspects both from silvicultural and utilization points of view. The object should eventually be to fix the limit at which trees begin to decay and beyond which it does not pay to grow them any longer. It will partly depend on the minimum size required on the market. When that limit has been fixed forest the aim should be to remove all stock over that limit and get the forests into as healthy a condition as possible."

34. It has been suggested that if Burma is separated from India there should be a 25 per cent. import tax on teak imported from Burma into India. Mainly for the reason that such a tax would make teak timber very much more expensive to the consumer and he would thereby be driven to use substitutes, this suggestion to tax imports of teak must be resisted most strenuously.

35. It is not merely these larger issues that render the price of timber dearer to the consumer; there are very numerous vexatious restrictions imposed by the Forest Department which must have the effect of deterring persons from taking out licences to work timber or from tendering for coupes of marked standing trees. It is worthwhile working out the "life history" of such persons:—

If a trader tenders for the right to work a coupe in a reserved forest, he first has to furnish security and deposit a certain sum of money. If, on the other hand, he only takes out a licence to work timber he does not have to furnish security. (The amount of timber extracted under a licence is generally smaller than that extracted under an agreement obtained by tender.) The trader must then take out a property-mark licence for which he has to pay Rs. 10 and if he wishes to mark his timber in any other way he must take out a classification hammer licence for which the fee is Rs. 1. If he takes out a licence to extract timber he must as a rule prepay the amount in full although he will not receive his timber for some

months afterwards. Under the conditions of the licence no tree shall be felled higher than 3 feet from the ground except to avoid hollow or unsound timber and all sound marketable timber shall be extracted from trees felled. The licence-holder must protect from fire all marketable timber felled and in the event of any marketable timber being partially or wholly destroyed by fire he is liable to pay full royalty on the timber destroyed.

The registered property mark must be impressed on the stump and on each log as a rule within 24 hours after the tree has been felled and the timber may not be removed from the site of felling or logging unless it has been impressed with the registered property mark. (The employees may perhaps fell the trees with high stumps or fail to stamp the property hammer within 24 hours after felling the trees. It may also happen that they fell unmarked trees or trees below the minimum girth specified in the licence or damage other trees in felling the trees they are entitled to fell). Even if some of the logs prove defective or if they cannot be extracted owing to their large size, they are measured up and their cubic contents are deducted from the amount for which the licence was issued. The licences are issued on a tonnage basis and if a man fells and extracts trees which yield more tons of timber than the amount for which the licence was issued, this is accounted as a forest offence and he is lucky if he escapes with payment of double royalty.

In some Forest Divisions the logs are inspected at stump by a Forester who, if satisfied that there have been no infringements of the conditions of the licence such as high stumps or waste in the top pieces, marks the logs with a "Sit" hammer and the logs may then be removed to a collecting point after each log has been measured and numbered with a serial number at stump. At the collecting point the trader has to find another forest subordinate who impresses each log with a revenue-paid hammer and who issues a receipt, ordinarily called a "bill". The possession of such a bill shows that the logs have definitely become the property of the trader. The trader then wishes to remove the logs and before he can do this he must take out a removal pass for each consignment for each destination. For this removal pass he has to find the ranger again and to pay 6 pias per log 4' 6" in girth and above and 3 pias per log less than 4' 0" and not less than 3' in girth. The timber may be stopped for examination at any revenue station. All removal passes must be returned within a certain time to the officer prescribed by the conditions printed therein under a penalty of a fine of Rs. 200.

When the timber has arrived at its destination, the trader probably wishes to convert it. For a saw-mill or saw-pit he has to take out a licence at 4 annas per month and for practically all saw-mills and for many saw-pits a bond has to be entered into binding the licence-holder to observe the conditions of such saw-pit licence and the conditions of all licences which may thereafter be granted to him and "covenanting that he, his servants and agents will abstain from all the acts prohibited by the Act or rules made thereunder and will also perform all acts imposed upon the holder of such licences by the said Act or Rules." Having converted the timber he probably wishes to remove it and if removal is other than by rail or by the boats of Messrs. The Irrawaddy Flotilla Company, Limited, or the Arakan Flotilla Company, Limited, he must take out a further removal pass for each consignment.

When the period of the licence has expired, whether he has extracted all the timber permitted under his licence or not, the trader has to return the original licence to the Forest Office. If he has lost the licence or for any other reason fails to return it, he is liable to prosecution. It seems to me rather an anomaly that such an omission should be a criminal offence at all, but in one division fines were imposed in 91 cases in one year for non-return of expired licences. Admittedly the maximum penalty under Rule 98 is Rs. 25 only, but a very large proportion of the 11,978 forest offence cases last year consisted of very venial "crimes" committed by timber traders. Such a trader is very much in the hands of his employees (coolies) and he is indeed fortunate if he escapes being fined for an infringement of the conditions of the licence or the Rules under the Burma Forest Act. The ultimate effect of many of these penalties can only be to increase

the price of timber to the consumer. In the past this did not matter very much but conditions have changed considerably in the past few years.

None of those vexatious restrictions would be possible or would be enforced if the forests were not the property of Government.

36. (1) In the past a keen demand for timber has often been associated with gross waste of forest resources. Except where a strong Government Forest Department has controlled extraction strictly, the timber trade has usually creamed the most profitable trees and logs without troubling about the future. This has been seen in America, India, Karooni, Siam and elsewhere. The first task of the Indian Forest Department, both in India and Burma, was to check the excessive extraction, creaming and waste in active progress. Much essential work has been done in this respect with good results. It is not suggested that this past policy was wrong but it is suggested that times have changed and a new policy is necessary. Whilst continuing to check destructive exploitation and waste of potential revenue the Forest Department must realise that in ordinary commercial forests to sell trees is as much a part of the duty of the Department as to grow them.

(2) Until recently the Department has usually had to act as a brake on a demand exceeding the supply. In the future the supply will in Burma exceed the demand.

(3) The teak trade itself is faced with this new situation. Teak is an exceptionally good wood and in the past it has sold very easily and profitably. In future it will meet increasing competition and will probably have to improve in quality and come down in price to hold its own.

(4) The same remarks apply to other hardwoods. It behoves the Forest Department therefore to modify its traditional attitude towards the timber trader and help him to sell his wood instead of acting simply as a brake on his activities. The change can be made without sacrificing any vital principles. There is a happy mean between working a forest to destruction without thought of the future and conserving it by mistaken rules so onerous and vexatious that trade is hampered unnecessarily and markets are lost which could have been held.

Silviculture is a means to an end and normally that end is the sale of trees. Girth limits and regeneration rules should be considered at least as much in their bearing on Utilization as on Silviculture. Royalty rates are a double-edged weapon; if too high they reduce the final volume of sales and hamper wood in competing with substitutes. Rules to prevent wasteful logging and extraction are good within reason but not if pushed too far. A check on major dishonesty and carelessness is essential but it is wrong to enforce such strict rules that good traders are discouraged from working and unnecessary expense is added to the production cost of timber reaching a market which is increasingly competitive.

S. F. HOPWOOD,

*Chief Conservator of Forests,
Burma.*

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